

WHAT IS CLAIMED IS:

1. A method of fabricating a capacitor on a substrate comprising the steps of:
 - etching at the same time a gate electrode region for a transistor and a first capacitor electrode region on a capacitor foundation formation on the substrate;
 - depositing a first conductive material in the etched gate electrode region and in the etched first capacitor electrode region;
 - performing chemical mechanical polishing of the conductive material to yield a gate electrode and a first capacitor electrode;
 - depositing a dielectric layer over the gate electrode and the first capacitor electrode;
 - etching a second capacitor electrode region in the dielectric layer;
 - forming a capacitor dielectric layer over the first capacitor electrode;
 - depositing a second conductive material in the etched second capacitor electrode region; and
 - performing chemical mechanical polishing of the second conductive material to yield a second capacitor electrode;
 - the first and second capacitor electrodes and the capacitor dielectric layer forming a capacitor.
2. The method of claim 1, wherein the capacitor foundation formation includes an oxide layer, and the step of performing chemical mechanical polishing of the conductive material to yield a gate electrode and a first capacitor electrode utilizes the oxide layer as a polish stop.

3. The method of claim 2, wherein the step of performing chemical mechanical polishing of the conductive material to yield a gate electrode and a first capacitor electrode yields a first capacitor electrode in the form of a plate.

4. The method of claim 3, wherein the step of performing chemical mechanical polishing of the second conductive material to yield a second capacitor electrode yields a second capacitor electrode in the form of a plate.

5. The method of claim 2, wherein the step of performing chemical mechanical polishing of the conductive material to yield a gate electrode and a first capacitor electrode yields a first capacitor electrode in a cylindrical form.

6. The method of claim 5, wherein the step of performing chemical mechanical polishing of the second conductive material to yield a second capacitor electrode yields a second capacitor electrode in a cylindrical form.

7. The method of claim 1, wherein the capacitor foundation formation includes a nitride layer, and the step of performing chemical mechanical polishing of the conductive material to yield a gate electrode and a first capacitor electrode utilizes the nitride layer as a polish stop.

8. The method of claim 7, wherein the step of performing chemical mechanical polishing of the conductive material to yield a gate electrode and a first capacitor electrode yields a first capacitor electrode in the form of a plate.

9. The method of claim 8, wherein the step of performing chemical mechanical polishing of the second conductive material to yield a second capacitor electrode yields a second capacitor electrode in the form of a plate.

10. The method of claim 7, wherein the step of performing chemical mechanical polishing of the conductive material to yield a gate electrode and a first capacitor electrode yields a first capacitor electrode in a cylindrical form.

11. The method of claim 10, wherein the step of performing chemical mechanical polishing of the second conductive material to yield a second capacitor electrode yields a second capacitor electrode in a cylindrical form.

12. A method of fabricating a capacitor on a substrate comprising the steps of:

performing capacitor foundation formation on the substrate;

depositing polish stop layer material on the capacitor foundation and the substrate;

etching a first capacitor electrode region on the capacitor foundation formation and a transistor gate region on the substrate;

depositing a first conductive material in the etched first capacitor electrode region and the transistor gate region;

performing chemical mechanical polishing on the deposited first conductive material to yield a gate electrode and a first capacitor electrode;

depositing a dielectric material over the gate electrode and the first capacitor electrode;

etching a second capacitor electrode region in the dielectric material over the first capacitor electrode and into the first capacitor electrode material;

forming a capacitor dielectric layer over the first capacitor electrode;

depositing a second conductive material in the etched second capacitor electrode region; and

performing chemical mechanical polishing on the deposited second conductive material to yield a second capacitor electrode.

13. The method of claim 12, wherein the step of depositing polish stop layer material on the capacitor foundation substrate includes depositing polish stop layer material comprising an oxide.

14. The method of claim 12, wherein the step of depositing polish stop layer material on the capacitor foundation substrate includes depositing polish stop layer material comprising a nitride.

15. The method of claim 12, wherein the steps of performing chemical mechanical polishing on the deposited first conductive material to yield a first capacitor electrode yields a first electrode in the form of a plate, and performing chemical mechanical polishing on the deposited second conductive material to yield a second capacitor electrode yields a second electrode in the form of a plate.

16. The method of claim 12, wherein the steps of performing chemical mechanical polishing on the deposited first conductive material to yield a first capacitor electrode yields a first substantially cylindrical electrode and performing chemical mechanical polishing on the deposited second conductive material to yield a second capacitor electrode yields a second substantially cylindrical electrode.